



OPERATORS MANUAL FOR USE WITH

MX101 MAXIMIX ORBITAL SHAKER

MD101 MIDIMIX MULTIPURPOSE SHAKER

MN101 MIDIMIX MICROTUBE SHAKER

MN201 MINIMIX MICROPLATE SHAKER

ISSUE 2 MARCH 2004

TABLE OF CONTENTS	Page
1.0. GENERAL DESCRIPTION	3
1.1. DEFINITION	3
1.2. PRINCIPE OF OPERATION	3
2.0. TECHNICAL FEATURES	3
2.1. CONSTRUCTION	3
2.2. GENERAL FEATURES OF SHAKER	3
3.0. INSTALLATION OF SHAKER	5
3.1. UNPACKING	5
3.2. SELECTING THE RIGHT PLACE	5
3.3. ATTACHING POWER CORD	5
3.4. ENVIRONMENT CONDITIONS	6
4.0. PROPER INSTALATION OF SHAKER PLATE (Vibromix 30)	6
5.0. INSTRUCTIONS FOR USE	7
5.1. INTRODUCTION	7
5.2. BASIC OPERATION	7
5.3. ADDITIONAL OPERATIONS	10
6.0. DESCRIPTION OF ABNORMAL USE	11
6.1. GENERAL DESCRIPTION	11
7.0. TROUBLESHOOTING GUIDE	11
8.0. REGULAR MAINTANCE	12
8.1. CLEANING	12
9.0. WARRENTY	12

1.0. GENERAL DESCRIPTION

1.1. DEFINITION

This range of shakers is intended for shaking microtiter plates, tubes, bottles, dishes and other laboratory vessels. Shaker is driven by the asynchronous motor, which enable silent operation, constant shaking speed independent of the load or power supply oscillations.

1.2. PRINCIPE OF OPERATION

Device consists of two main parts:

- Motor with eccentricity mechanism
- Control electronics

Motor movement causes orbital movement of shaker's eccentricity mechanics and generates shaking effect.

Control electronics supervises motor RPM, TIME and keyboard functions.

2.0. TECHNICAL FEATURES

2.1. CONSTRUCTION

The casing of shaker is made of steel plate varnished with high resistant polyurethane lacquer.

2.2. GENERAL FEATURES OF SHAKERS

MN201 MIDIMIX MICROPLATE SHAKER

ELECTRIC POWER SUPPLY	230V \pm 10% - 50Hz, 115V \pm 10% - 60Hz
MOTOR POWER	15W
FUSE	2 x 0.25A 230V 2 x 1 A 115V
RPM REGULATION	DIGITAL, load independent, from 100 to 1200 (1400 - 115V version) RPM in 10 RPM steps
SHAKER ORBIT	3 mm
TIMER	30 sec - 99min 50sec. in 10 sec. steps, under 10 min. in 1 sec. steps, timer HOLD function
LOAD	Max. 2 kg
DIMENSIONS W x L x H	170mm x 275mm x 130mm
WEIGHT	4,3 kg

MN101, MN201 MINMIX MULTIPURPOSE SHAKER

ELECTRIC POWER SUPPLY	230V \pm 10% - 50Hz, 115V \pm 10% - 60Hz
MOTOR POWER	15W
FUSE	2 x 0.25A 230V 2 x 1 A 115V
RPM REGULATION	DIGITAL, load independent, from 100 to 1200 RPM in 10 RPM steps
SHAKER ORBIT	3 mm
TIMER	30 sec - 99min 50sec. in 10 sec. steps, under 10 min. in 1 sec. steps, timer HOLD function
LOAD	Max. 2 kg
DIMENSIONS W x L x H	255mm x 312mm x 130mm
WEIGHT	5,6 kg

MD101 MIDIMIX MULTIPURPOSE SHAKER

ELECTRIC POWER SUPPLY	230V \pm 10% - 50Hz, 115V \pm 10% - 60Hz
MOTOR POWER	15W
FUSE	2 x 0.25A 230V 2 x 1 A 115V
RPM REGULATION	DIGITAL, load independent, from 50 to 600 RPM in 10 RPM steps
SHAKER ORBIT	3 mm – 611 code shaker 5 mm – 612 code shaker 10 mm – 613 code shaker 38 mm – 614 code shaker
TIMER	30 sec - 99min 50sec. in 10 sec. steps, under 10 min. in 1 sec. steps, timer HOLD function
LOAD	Max. 2 kg
DIMENSIONS W x L x H	255mm x 312mm x 130mm
WEIGHT	7,1 kg

MX101 MAXIMIX ORBITAL SHAKER

ELECTRIC POWER SUPPLY	230V \pm 10% - 50Hz, 115V \pm 10% - 60Hz
MOTOR POWER	50W
FUSE	2 x 1 A 230V 2 x 2 A 115V
RPM REGULATION	DIGITAL, load independent, from 20 to 300 RPM in 1 RPM step
SHAKER ORBIT	20 mm
TIMER	30 sec - 99min 50sec. in 10 sec. steps, under 10 min. in 1 sec. steps, timer HOLD function
LOAD	Max. 10 kg
DIMENSIONS W x L x H	390mm x 465mm x 160mm
WEIGHT	21 kg

3.0. INSTALLATION OF THE SHAKER

3.1. UNPACKING

Before starting the installation, carefully examine the delivery for possible damage or missing parts.

- Open the box and lift the device together with shock absorbers, out of the box.
- Remove the shock absorbers and check that the shaker has not been visibly damaged during the transportation. Keep the packing material until you are sure that the shaker works properly.
- Check information on shaker rear plate on:
 - Type
 - Serial Number
 - Article number
- Check that the mains cord has a pin configuration that will fit into a wall socket according to the local standard.

Should any kind of damage have occurred during transportation, immediately make a complaint to the carrier. Any incorrect delivery or missing parts should be reported to the distributor.

3.2. SELECTING THE RIGHT PLACE

When selecting the right place for device, please consider following:

- Put the device on smooth, horizontal and stable place.
- Leave enough space beyond the device for normal air circulation, min. 10 cm.
- Leave enough space around the device, that you will easy control and maintain it.
- Don't use the device in surroundings, where there are fast temperature and humidity changes. Please avoid also such places, which are under direct access of sun light or places nearby devices which producing heat.
- Avoid such places, where exist possibility of shocks and vibrations.

Note: The equipment shall not be placed so, that it is difficult to pull out a plug from mains cord.

3.3. ATTACHING POWER CORD

Fit the mains cord, which is included in the delivery, into the mains receptacle. Connect the other end of the cord to a grounded wall socket. To avoid interference from noise, surges and spikes, a dedicated line is preferred. If no such line is available, avoid lines to which powerful electric motors, refrigerators and similar devices are connected.

The power can be turned on and off by means of the main switch located on the front panel of the device. Light, mounted in the switch indicates that power is on.



Take care when you plug cord to a grounded wall socket. Do not touch plug with wet hand, because it can be very dangerous. Plug cord to a grounded wall socket only with dry hand.

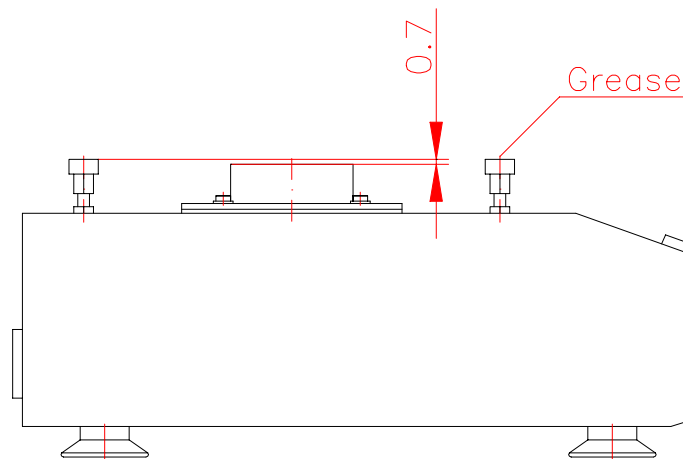
•

3.4. ENVIRONMENT CONDITIONS

The shaker has been built for operating in laboratory environments. Therefore the environmental parameters as reference are the following:

- Temperature between -10°C to $+70^{\circ}\text{C}$
- Humidity up to 85% RH, non-condensing

4.0. PROPER INSTALATION OF SHAKER PLATE (MN201MIDIMIX MICROPLATE SHAKER)



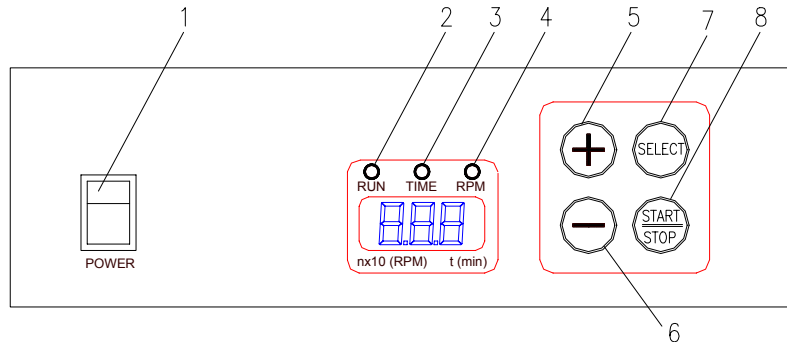
Before you fix appropriate shaking plate you have to fasten slide accessories on proper position and lubricate the slide accessories a little with the enclosed grease (see upper picture).

Each of the shaking plates has the rubber coating surface with the circle cutout and the fixing screws in the center. Remove circle cutout rubber, screw down four screws on shaker. After fix the shaking plate, remove non-adhesive backing paper of the rubber circle cutout and paste it on to same place.

The grease, which you use to lubricate the slide accessories, is sufficient for 1000 working hours (1 year). After that time you should remove the shaking plate and clean the slide accessories. If the slide accessories are worn out too much, you should replace them and then set them to appropriate height.

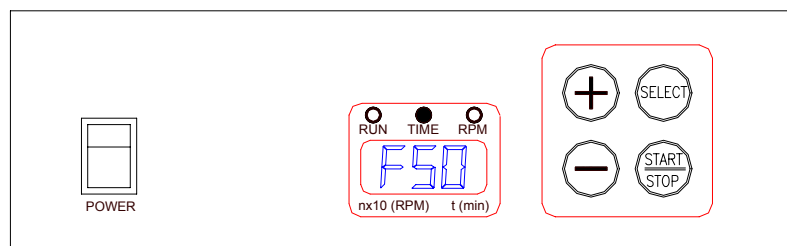
5.0. INSTRUCTIONS FOR USE

5.1. INTRODUCTION

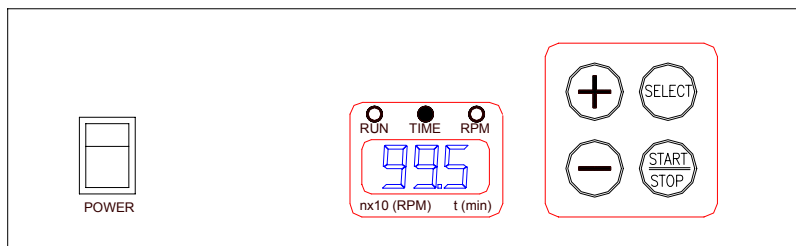


1. POWER key – switch ON (power key shine) or OFF shaker
 2. RUN green signal light – shine when shaker running
 3. TIME yellow signal light – shine when shaker is set on time
 4. RPM yellow signal light – shine when shaker is set on rpm
 5. + Button – set up values for TIME or RPM
 6. – Button – set down values for TIME or RPM
- If you hold (+) or (-) button for long time values go up or down on display quickly.
7. SELECT button – select between TIME and RPM mode
 8. START/STOP button – START or STOP shaking

5.2. BASIC OPERATION



- Press POWER key on control panel. On display shaker automatically detect supply frequency F50 or F60. Likewise shaker is then set on time.

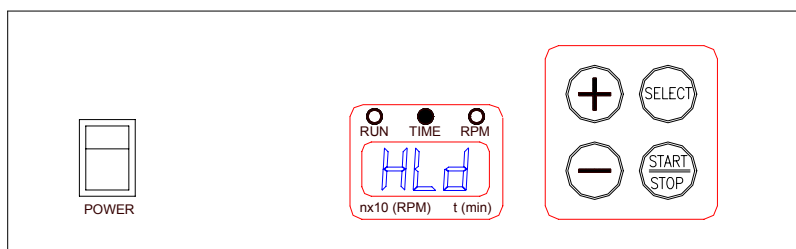


- Time signal light shine. With pressing button (+) or (-) set time on desire value from 30 sec to 99 min 50 sec:

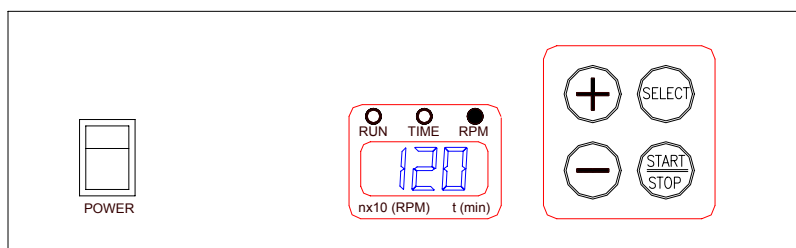
99.5 \Rightarrow 99 min 50 sec

9.59 \Rightarrow 9 min 59 sec

0.30 \Rightarrow 30 sec



- If you want set time on hold - continue operation set HLd on display. You get HLd function on display under 0.30 or above 99.5 Press SELECT button.

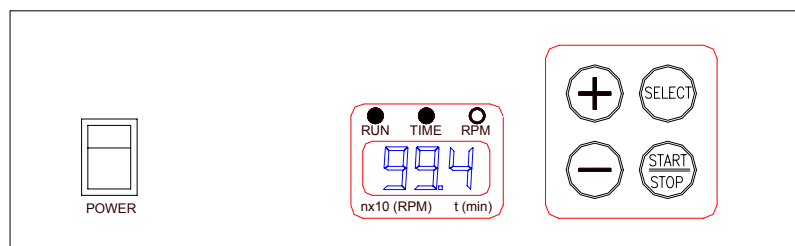


- RPM signal light shine. . With pressing button (+) or (-) set RPM on desire value:

34 \Rightarrow 340 Rpm

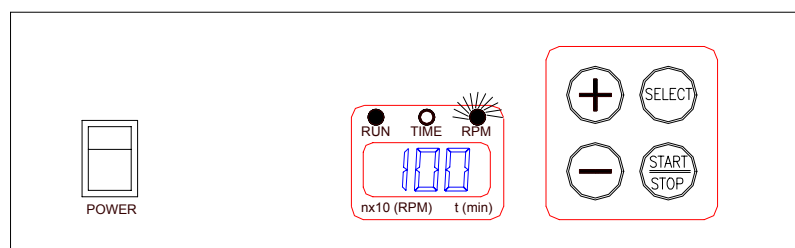
120 \Rightarrow 1200 Rpm

Press START/STOP button.

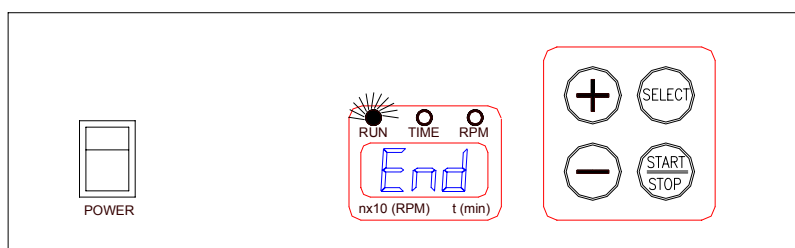


- RUN and TIME signal light shine. Shaker count down time from set value.

NOTE: YOU CAN NOT MODIFY TIME DURING SHAKING

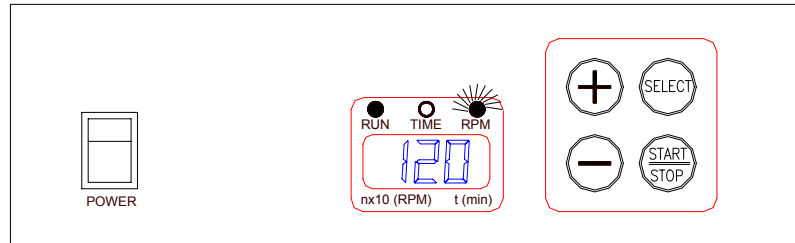


- If you want change RPM during shaking press SELECT button if shaker is not set on RPM (RPM signal light shine). With pressing button (+) or (-) select RPM on desire value. In the meantime RPM signal light pulse. When you stop pressing button (+) or button (-) signal light RPM stop pulse after 2 sec.



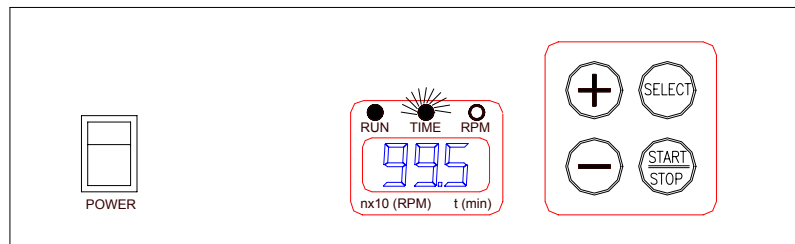
- When time elapse or you press again START/STOP button on display is shown inscription End and signal light RUN pulse. When shaker completely stop shaking it place itself on last used values for TIME and RPM.

5.3. ADDITIONAL OPERATIONS



- If you want to look set value for RPM during shaking press button (+) or button (-) only for ONE CLICK. On display pulse RPM signal light for 2 sec and display show set RPM. After 2 sec is on display again shown real RPM and signal light stop pulse.

NOTE: Shaker must be on RPM mode – RPM signal light must shine.



- If you want to look set value for TIME during shaking press button (+) or button (-) only for ONE CLICK. On display pulse TIME signal light for 2 sec and display show set TIME. After 2 sec is on display again shown real TIME and signal light stop pulse.

NOTE: Shaker must be on TIME mode – TIME signal light must shine.

6.0. DESCRIPTION OF ABNORMAL USE

6.1. GENERAL DESCRIPTION

- Do not use the device nearby water sources. Take care, that water will not drop in the device, especially by cleaning procedures.
- Do not use device in aggressive atmosphere.
- Do not put any electricity conducting objects into the device. It could happen that you could touch dangerous voltage points. To avoid such shock hazards or destroying the device it is better in case of malfunction to call authorized service provided by your distributor.

In case of malfunction unplug the device from mains and call authorized service. You have to call the service in following cases:

- Mains cord or mains receptacle are harmed or destroyed.
- Liquid was drooped into the device.

NOTE:

In case that device is not function properly even you have exactly followed instructions described in User's Manual, you are allowed to use only those commands and procedures, which are allowed by User's Manual. Use of any other commands and procedure's adjustments could result in device destruction or longer service repair time.

If the equipment is used in a manner not specified by the manufacturer, the protection provide by the equipment may be impaired.



Do not shake inflammable or explosive samples!

7.0. TROUBLESHOOTING GUIDE

Problem	Explanation / Solution
POWER key doesn't shine	Check the power supply Check fuses Call nearest service
Display doesn't shine	Call nearest service
Message ER1 on display	Call nearest service
Message ER2 on display	Call nearest service
Message ER3 on display	Call nearest service
Message ER4 on display	Call nearest service

8.0. REGULAR MAINTIANANCE

- No extra regular maintenance is needed.
- The maintenance people should regularly check the device operation at least once a year.
- Regular cleaning recommended.

8.1. CLEANING

Housing of Shaker Unit can be cleaned with special cleaners for plastic surfaces (car interior-armature).

NOTE:

Do not use any aggressive or abrasive cleaners (acetone, nitro, polish etc.) because its surface can be permanently damaged.



Before cleaning device, unplug main cord from wall socket.

9.0 Warranty

The manufacturer warrants this product against defects in material and workmanship for a period of one year from receipt by the end user. During the warranty period the manufacturer will, at their discretion, either repair or replace the product/s, which prove to be defective.

Should this instrument require service attention or if replacement parts are required, please contact:

UK

The Service Department
Thermo Scientific
Unit 5,
The Ringway Centre
Edison Road
Basingstoke
Hampshire
RG21 6YH
Tel: 0870 609 9203
Fax: 0870 609 9202

Other Countries

Please contact the local authorised Thermo Scientific Distributor or Service Agent.